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Feuille réceptrice d'images

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- **PATENT ABSTRACTS OF JAPAN vol. 12, no. 169 (M-699)(3016) 20 May 1988& JP-A-62 282 967 (CANON K.K.) 8 December 1987**
- **PATENT ABSTRACTS OF JAPAN vol. 12, no. 169 (M-699)(3016) 20 May 1988 & JP-A-62 282 968 (CANON K.K.) 8 December 1987**

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and also drop

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Description

BACKGROUND OF THE INVENTION

This invention relates to an image-receiving sheet which is used in combination with a heat transfer sheet, for performing recording corresponding to information by heat transferring the dye or pigment in the heat transfer sheet.

The heat transfer recording system has been widely utilized as the recording system in a printer such as that in a computer, word processor, and other devices. In recent years, attempts have been made to use a heat-transfer sheet having a heat transfer layer containing a sublimatable dye provided on the surface of a substrate such as polyethyleneterephthalate in combination with an image-receiving sheet and perform overlayed recording of cyan, magenta, yellow, etc. thereby to accomplish recording of images of natural color photographic tones on said image-receiving sheet. This technique is being utilized in the case of, for example, recording an image directly on a CRT display.

As such image-receiving sheets, those with a construction having a receiving layer provided on the surface of a resin with high heat resistance such as polyethyleneterephthalate, non-foamed film of polypropylene type resin, or a synthetic paper using a polyolefin type resin or a polystyrene type resin as the base material have been known in the art.

However, an image-receiving sheet using polyethyleneterephthalate, etc., as the substrate may incur a lowering in its transferred image density due to high rigidity and low thermal insulating property of the substrate, and yet sometimes smooth sheet delivery may not be obtained. Consequently, there have been the drawbacks such as printing drift or color drift occurring when overlayed printing is repeated several times as in color printing, whereby transferred images of high sharpness could not be obtained.

Also, while printing according to the heat -transfer system has been done by means of a heating printing means such as a thermal head, since the heat during transfer is applied only from one direction of the sheet in the image-receiving sheet of the prior art, the substrate of the image-receiving sheet curls so that the receiving layer side is on the concave inner side, thus resulting in the drawback of poor transfer.

Further, after a desired image has been once transfer recorded on a receiving layer by heating the heat transfer sheet as described above by means of a thermal head, the image may be transferred onto a transferable article such as telephone card in some cases. When used as transferred on a transferable article, a transparent image-receiving layer is provided on a transparent substrate, and after forming, for example, a reverse image on the image-receiving layer, heat transfer is carried out directly on an article, or through an adhesive sheet in the case of a cloth or the like. The transparent substrate may be permitted to remain as it is on the article to provide a protective layer or, alternatively, it may be peeled off to make the image-receiving layer the protective layer.

However, with a sheet having only a transparent receiving layer provided on a transparent substrate, there is the problem of difficulty of detecting the state of sheet delivery in the heat transfer device. Further, in transparency of the prior art, a support comprising a polyethyleneterephthalate film, or the like containing generally titanium white, etc. has been used as laminated, freely peelable on the back surface of the substrate for the purpose of reinforcement of the sheet. Thus, in the image-receiving sheet for transfer onto a transferable article having a support in laminated state on the substrate back surface, the transparent substrate is generally as thin as about 6 to 25 μ, but since the image-receiving sheet is further laminated on the back surface with a support comprising a non-foamable resin, the rigidity as a whole becomes too high.

For this reason, the actual contact dot area between the heat transfer sheet and the image-receiving sheet becomes smaller as compared with the dot area heated by a thermal head. As the result, the density of the transferred image is low, and yet delivery of the image-receiving sheet during heat transfer in the transfer device cannot be conducted smoothly by means of the transfer device, whereby there has been the problem of printing drift or color drift in the case of performing overlayed transfer repeatedly as in color transfer.

EP-A-0 234 563 discloses an image-receiving sheet for use in heat transfer recording, said sheet comprising a base sheet, a receiving layer provided on one surface of the base sheet for receiving a dye or a pigment migrating from a heat transfer sheet, said base sheet comprising a laminate having a synthetic paper preferably containing microvoids and a core material. DE-A-32 39 187 and DE-A-32 39 198 describe heat-sensitive recording sheets comprising a base sheet and a heat-sensitive, color-forming layer containing a colorless, color-forming compound and a color-developing compound, which is coated on the surface of the base sheet.

The present invention has been accomplished in view of the above points and is intended to provide an image-receiving sheet which has high printing density and yet is free from printing drift, color drift, and other drawbacks.

Another object of the present invention is to provide an image-receiving sheet which can perform sheet delivery in a transfer device smoothly and yet without the possibility of incurring deleterious influence or curling by the heat applied during transfer.

The present invention is an image-receiving sheet for use in heat transfer recording, comprising a base sheet and a receiving layer provided on one surface of said base sheet for receiving a dye or a pigment migrating from a heat transfer sheet during said heat transfer recording, said receiving layer comprising a resin which is capable of receiving

the thus migrated dye or pigment from the heat transfer sheet, said base sheet comprising a laminate of (i) a first layer having a porous structure or foamed structure and (ii) a second layer comprising a non-foamed structure, said first layer being disposed between said second layer and said receiving layer, said second layer being provided on said first layer in a freely peelable off state.

Further, the invention is an image-receiving sheet for use in heat transfer recording, comprising a base sheet and a receiving layer provided on one surface of said base sheet for receiving a dye or a pigment migrating from a heat transfer sheet during said heat transfer recording, said receiving layer comprising a resin which is capable of receiving the thus migrated dye or pigment from the heat transfer sheet, said base sheet comprising a porous structure or foamed structure and having no non-porous or non-foamed layer.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIGS. 1 through 5 are sectional views respectively showing specific examples of the image-receiving sheet of the present invention, FIG. 3 being a sectional view showing the state of transferring an image by the use of the image-receiving sheet of the present invention to a specific article; and
FIG. 6 is a sectional view showing the state of the image transferred to a specific article.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings, preferred embodiments of the present invention will now be described.

As shown in the sectional view in FIG. 1, the first embodiment of the image-receiving sheet of the present invention has a receiving layer 2 on the surface of a base sheet 1 having a porous structure or a foam structure.

In the example shown in FIG. 2, the base sheet 1 comprises a substrate 1a and a support 1b. Further, in this example, an intermediate layer 3 is formed between the base sheet 1 and the receiving layer 2.

The constitution and the materials of the image-receiving sheet of the present invention will first be described in detail primarily with respect to these examples.

Base sheet

In the present invention, the base sheet comprises one or two or more layers, and at least one layer of the base sheet has a porous structure or a foam structure. The material having a porous or foam structure can be obtained according to, for example, such methods as described below.

(a) The method in which a thermoplastic resin is stretched with addition of inorganic or organic fine particles, whereby voids are generated around the fine particles.
(b) The method in which an organic solvent solution of a synthetic resin is extruded through an orifice, and then introduced into a coagulating bath to cause coagulation by desolventization, whereby voids are generated through elimination of the solvent.
(c) The method in which a resin is extruded together with a foaming agent to carry out extrusion foaming.

As the base sheet, laminated products of these materials can be also used. When produced according to the method of (c), those with small cell sizes are particularly preferred.

As the material for the base sheet, one having high heat resistance such as a polyester (e.g., polyethyleneterephthalate), an aliphatic polyamide (e.g., 6-nylon), an aromatic polyamide, polycarbonate, polyallylate, polyether, polyethersulfone, polyether ether ketone, polyether imide and polyimide are preferred, but it is also possible to use polyolefins such as polyethylene and polypropylene, polyvinyl chloride, polyvinylidene chloride, polyvinyl alcohol, acrylic resins, cellulose resins, styrene resins, ethylene-vinyl acetate copolymer, ethylene-vinyl alcohol copolymer, ionomer, etc.

The thickness of the base sheet is preferably of the order of 50 to 200 μm. As to the density of the base sheet 1 (density of the weight per 1 m^2 divided by the thickness), it is preferably 90% or less, particularly 80% or less, and 50% or more, relative to the density of the non-foamed product of the same material, for improvement of printing quality and maximum heat insulating effect.

As shown in FIG. 2, in the present invention, the base sheet can be made as a laminate of the substrate 1a and the support 1b, and in this constitution, by providing the support 1b, an excellent effect for improvement of delivery performance of the sheet in the transfer device for sheet is exhibited. As the support 1b, a synthetic resin film, a white synthetic resin film containing a pigment such as titanium white, etc., a cellulose fiber paper such as a coated paper or cast coated paper is used, and as the above synthetic resin, the same resins as those for the substrate 1a can be employed, but other resins may also be employed. When the support 1b is constituted of a synthetic resin film or a white synthetic

resin film, it may be constituted of either the same material resin as the substrate 1 or a different material resin.

If the support 1b is laminated in a freely peelable state with the substrate 1a, the delivery performance of the sheet in the transfer device during transfer can be improved, and also a procedure such as peeling after transfer is possible. For laminating the support 1b as in a freely peelable manner with the substrate 1a, it is possible to empoly the method in which both are caused to adhere with a weak tackifier or the method in which the support 1b surface is subjected to a release treatment, and the substrate 1a is coated on the receiving layer non-forming surface with a strong tackifier, a heat-sensitive adhesive, etc. and dried before being caused to adhere. In the latter method, the substrate 1a from which the support is peeled off (the receiving layer having already an image transferred thereon) can also be used as the label attached with the tackifier. Also, the support 1b can have a detection mark for positioning in the transfer device during heat transfer printing. Further, on the back of the support 1b, for improvement of paper passage, a lubricating layer comprising an acrylic resin, methacrylic resin, etc. or an antistatic layer such as a surfactant can be formed.

The support 1b, when used for a use such as transferring the transferred image further to another image-receiving member 15, will be finally peeled off from the substrate 1a.

FIG. 3 indicates the manner in which transfer is carried out onto an image-receiving member 15 such as a card, reference numeral 14 designating an image, 4 a primer, and 5 a weak tackifier layer.

Image-receiving sheets to be used by transfer onto articles such as cards and fabrics are generally of the following two types.

(I) A plastic film such as polyethyleneterephthalate is subjected to a primer treatment, if necessary, and an image-receiving layer is provided thereon. The silicone which is the release agent on the image-receiving surface is cured. On the other hand, on one surface of the foamed polyethyleneterephthalate which is the support, a slip layer for making delivery within the printer smooth is provided and provided with mark printing, if necessary, while on the opposite surface is applied a primer treatment, if necessary, followed by coating of a weak tackifier thereon. The transparent substrate provided with the above image receiving layer, at its surface having no image-receiving layer, is caused by pressure to adhere with a weak tackifier thereby to provide an image-receiving sheet. A sublimatable dye image (ordinarily reverse image) is formed at the image-receiving surface of the image-receiving sheet, and the image-receiving surface is caused by hot pressurization with hot rollers to adhere onto an article made readily adherable by primer treatment, for example, the primer treated surface of a card substrate. The support can be peeled off together with the weak tackifier to obtain a decorated article. In this case, the film such as transparent polyethyleneterephthalate becomes the protective layer to improve the storability of the card. Particularly, when storability is important, it is desirable to add a photostabilizer, etc., internally of the transparent film and/or the image receiving layer.

(II) Alternatively, for making the support readily peelable, in place of using the weak tackifier as described above, an image-receiving sheet with the following constitution can be also made. That is, on a smooth film of polyethyleneterephthalate, a peeling layer is formed and an image-receiving layer is provided thereon. In this case, the sheet assembly is so designed that the adhesive force between the peeling layer and the smooth film will be weaker than the adhesive force between the peeling layer and the image-receiving layer. On the other hand, the- surface of the foamed polyethyleneterephthalate which is the support, on which no slip layer is provided, is subjected to a primer treatment, if necessary, coated with an adhesive, and caused to adhere by contacting the surface having no image-receiving layer of the smooth film provided with the above image-receiving layer with the adhesive. After formation of a sublimating dye image on the image-receiving surface, heat transfer is effected on an article similarly as described above to make a decorative article. In this case, the image-receiving layer or the peeling layer functions as protection of the image.

In either of the cases (I) and (II), the transparent plastic sheet or the smooth plastic film is preferably on the thinner side so that the cushioning characteristic of the foamed polyethyleneterephthalate which is the support will contribute to the effect, and a film with a thickness of about 6 to 25 μm is generally used.

The image-receiving sheet of the present invention, by the use of a base sheet comprising a material having a porous or foamed structure, can produce a transferred image with high density by the cushioning action and heat insulating action of the base sheet, and can also obtain smooth delivery of the image-receiving sheet in the transfer device, whereby there is no possibility of printing slippage due to irregularity of delivery or color drift during color transfer. Yet there is also no possibility of curling of the substrate by heating during printing, thus producing the excellent effect of obtaining a clear and good transferred image.

Receiving layer

For the receiving layer, it is desirable to use a resin having dyeability with respect to a sublimatable dye and weathering resistance. Specifically, the following examples may be included.

(1) Saturated polyester resin, polyurethane resin, polystyrene resin, polyamide resin, vinyl chloride resin, vinyl chloride-vinyl acetate-copolymer resin, copolymer of vinyl chloride and acylic acid type monomer, polyvinyl acetate, polycarbonate resin, epoxy resin, and ethylene-vinyl acetate type resin. Among these, copolymers of vinyl chloride-acrylic acid type monomer and polyamide resin are particularly preferred. Also, a resin composition composed mainly of vinyl chloride can be formed into a film according to the film forming processing method such as the calendering method and used as the receiving layer, which can be used particularly with a foamed sheet caused to adhere thereon or adhere in a freely peelable state and is particularly suitable for OHP, labels, etc.

(2) When a copolymer of vinyl chloride with an acrylic acid type monomer is used as the resin for the receiving layer, a receiving layer having good dyeability as well as weathering resistance can be obtained.

Examples of acrylic acid type monomers are acrylates such as methyl acrylate, ethyl acrylate, 2-ethylhexyl acrylate, 2-hydroxyethyl acrylate, and trimethylolpropane triacrylate; methacrylates such as methyl methacrylate, t-butyl methacrylate, triethyleneglycol dimethacrylate, and trimethylolpropane methacrylate; acrylic acid or methacrylic acid and acrylic acid metal salts.

As acrylates, those having a functional group, particularly acrylates or methacrylates having a hydroxyl group in the side chain are desirably used because dyeability can be remarkably enhanced.

The copolymerization ratio of vinyl chloride to an acrylic acid type monomer is desirably vinyl chloride/acrylic acid type monomer = 50 to 90%/50 to 10%, and its molecular weight is 5,000 to 40,000, preferably 10,000 to 30,000.

Also, it is possible to use a copolymer of vinyl chloride and an acrylic acid type monomer copolymerized with other monomers such as acrylonitrile, vinyl pyrrolidone, N-substituted maleimide, maleic acid, etc. In this case, the copolymerization ratio of other monomers is desirably of the order of 0.1 to 30%.

(3) As the receiving layer resin, a resin having an amide bond (NH-CO-) or a modified resin which is a derivative of said resin may be also used.

The resin having an amide bond is obtained by, for example, polycondensation of a dicarboxylic acid compound and a diamine compound. Examples of these dicarboxylic acids and diamines are as follows.

(A) Dicarboxylic acids:

① aliphatic dicarboxylic acids such as oxalic acid, malonic acid, succinic acid, oleic acid, maleic acid, adipic acid, eraidic acid, azelaic acid, sebacic acid, eicosanic diacid, and linoleic acid, and derivatives thereof;
② alicyclic dicarboxylic acid such as cyclopropane dicarboxylic acid, cyclohexane carboxylic acid, and bicyclooctane dicarboxylic acid, and derivatives thereof;
③ aromatic dicarboxylic acids such as phthalic acid, naphthalene dicarboxylic acid, biphenyl dicarboxylic acid, and isopropylidene dibenzoic acid, and derivatives thereof;
④ dicarboxylic acids such as oxaadipic acid, methyl 9-oxabicyclo[3,3,1]nonane-2,6-dicarboxylate, and 4,5-imidazole carboxylic acid, and derivatives thereof, and also dimers (dimeric acids) of linoleic acid, oleic acid, eraidic acid, and tall oil fatty acid.

(B) Diamine compounds:

① diamines such as ethylenediamine, trimethylenediamine, tetramethylenediamine, diaminobutane, pentamethylenediamine, hexamethylenediamine, heptamethylenediamine, octamethylenediamine, decamethylenediamine, and dodecamethylenediamine, and derivatives thereof;
② diamines such as phenylenediamine, diaminotoluene, diaminophenol, and isophoronediamine, and derivatives thereof.

A receiving layer prepared by the use of these polyamide resins is particularly excellent in dyeability.

(4) The receiving layer may be formed by the use of a resin composition composed mainly of polyvinyl chloride. Such a resin is a resin composition containing 50% by weight or more of polyvinyl chloride, specific examples of which are homopolymers only of polyvinyl chloride; copolymers of vinyl chloride copolymerized with 5 to 30% of vinylidene chloride, or an acrylate; a blend resin of polyvinyl chloride blended with other resins such as ethylene-vinyl acetate.

The resin composition composed mainly of polyvinyl chloride can incorporate 5 to 60%, preferably 10 to 50%, by weight of a plasticizer. If the amount of the plasticizer added is less than 5% by weight, the image-receiving layer becomes rigid and dyeability of a dye during transfer will be lowered. On the contrary, if it exceeds 60% by weight, although dyeability can be improved, blurring of image is liable to occur with elapse of time, whereby storability of image for a long period is inferior. Examples of the plasticizer are phthalic acid esters, dibasic acid esters, polyhydric alcohol esters, fatty acid esters, epoxy. fatty acid esters having the function as the stabilizer, and polymeric plasticizers such as ethylene-vinyl acetate copolymer, used singly or as combinations of two or more kinds.

(5) The above receiving layer resin which can be mixed with each other can be used as a mixture. Also, another resin with good dye dyeability may also be used as a mixture with the above receiving layer resin.

Examples of the resin with good dye dyeability are resins of polyester type, polyurethane type, vinyl acetate type, polystyrene type, epoxy type, amino type, and ethylene-vinyl acetate type.

Formation of the receiving layer may be practiced with the use of a composition for formation of a receiving layer obtained by dissolving or dispersing the receiving layer resin in a solvent according to a known coating method or printing method. Otherwise, after a layer has been formed once on a temporary carrier separated from the foamed sheet substrate, it may then be transferred onto the foamed sheet substrate.

In the case of a resin composition composed mainly of polyvinyl chloride, a film formed by the film forming processing method such as the calendering method may be used as the receiving layer, and a foamed sheet may be caused to adhere on the opposite surface or to adhere in a freely peelable state to provide an image-receiving sheet.

In the composition for formation of receiving layer, for improvement of the weathering resistance of the transferred image, one or two or more kinds of UV-ray absorbers, photostabilizers or antioxidants, etc. may be added, if necessary. These additives should be added each in an amount of 0.05 to 10 parts by weight based on 100 parts by weight of the resin.

It is also possible to add a white pigment in the composition for formation of the receiving layer for the purpose of improving whiteness, shielding property of the receiving layer, or further imparting writability to the image-receiving sheet surface, etc. As the white pigment, titanium oxide, zinc oxide, kaolin clay, calcium carbonate, silica, etc. can be employed, and the amount of the white pigment is preferably 5 to 50 parts by weight based on 100 parts of the resin constituting the receiving layer.

When the receiving layer is white and its surface reflection characteristic is within a certain range, the degree of whiteness is high and the image transferred appears beautiful. Its desirable range is such that the values of L, a and b as measured by the method defined by JIS-Z8722 and represented by the method defined by JIS-Z8730 are, respectively, L=90 or more, a=-1.0 to +2.0 and b=-2.0 to -5.0.

For falling within such a desirable range, it is necessary to incorporate a blue dye and a red dye other than the white pigment such as titanium oxide, and to incorporate further, if necessary, a fluorescent brightener, and control the respective contents. The above resin used in the receiving layer has a slightly yellow tint. By controlling the contents of these additives, good whiteness can be obtained. The amount of the white pigment added in the receiving layer is desirably 30% or less, particularly 10% or less based on the receiving layer resin. Accordingly, as the substrate coated with the receiving layer, one having values of L, a and b approximately in the above ranges is preferable, and particularly a foamed product of polyethyleneterephthalate is desirable.

The weight of the solvent in the receiving layer is desirably 1% or less of the weight of the solvent soluble components for forming the receiving layer. If the amount of the solvent remaining in the receiving layer is 1% or more, the solvent odor remains, and also the image tends to become obscure when stored for a long time after printing.

The thermoplastic resin for forming the receiving layer desirably has a glass transition point of 40°C or higher. When the glass transition point is lower than 40°C, dyeability can be improved, but the dye received tends to migrate toward the overlapped sheet side to be retransferred, and also the dye received is subjected to migration, whereby the image becomes obscure.

Release agent, Release agent layer

The image-receiving sheet of the present invention can contain a release agent in the receiving layer for enhancing releasability from the heat-transfer sheet. Examples of such a release agent are solid waxes such as polyethylene wax, amide wax, and Teflon powder, fluorine type, phosphoric acid ester type surfactants, and silicone oils, of which silicone oils are preferred.

As the above silicone oil, an oily one can be used, but a cured type oil is preferred. As the cured type silicone oil, the reaction cured type, the photocured type, the catalyst cured type, etc. may be used, but a silicone oil of the reaction cured type silicone oil is preferred. As the reaction cured type silicone oil, one obtained by the reaction curing of an amino-modified silicone oil and an epoxy-modified silicone oil is preferred. The amount of this cured type silicone oil is preferably 0.5 to 30 parts by weight based on 100 parts by weight of the resin constituting the receiving layer.

Also, a release agent layer can be provided by coating a part or all of the surface of the receiving layer with the above release agent dissolved or dispersed in an appropriate solvent and then drying the coating. As the release agent constituting the release agent layer, the reaction cured product of the amino-modified silicone oil and the epoxy-modified silicone oil as mentioned above is particularly preferred. The release agent layer should have a thickness of 0.01 to 5 μm, particularly 0.05 to 2 μm. The release agent layer may be provided on either a part of the surface of the receiving layer or the whole surface. When it is provided on a part of the receiving layer surface, dot impact recording, heat-sensitive melting transfer recording or recording with a pencil, etc. can be performed on the portion where no release agent layer is provided. It is also possible to perform the sublimating transfer recording operation by another recording

mode, such as by performing sublimating transfer recording at the portion where the release agent layer is provided and recording according to another recording mode at the portion where no release agent is provided.

Further, in the present invention, in place of a silicone resin, fluorine resin, etc., or under a state of mixture with respective resins, a thin layer of the hot release agent as shown below may be also provided:

(a) a hot release agent comprising as the main component a polymer having an organopolysiloxane component in the main chain or the side chain of the polymer;
(b) a hot release agent comprising as the main component a polymer having a long-chain alkyl component in the side chain of the polymer.

Intermediate layer

The intermediate layer 3 can be constituted of a resin such as a polyester, vinyl chloride-vinyl acetate copolymer, an acrylic resin, or polyvinyl acetate. By the provision of the intermediate layer, printing density can be further enhanced through its cushioning property.

The intermediate layer 3 is provided by coating a solution of the above resin dissolved in a solvent and drying the coating, or by melting and extrusion coating of the above resin.

Surface roughening treatment

In the present invention, the receiving layer on either its outer or front surface or the surface on the opposite side to the receiving layer forming surface can be suitably coated with an antistatic agent to prevent so-called "two-sheet feeding" during automatic paper feeding arising from electrostatic charges. However, when the effect of preventing two-sheet feeding only with the antistatic agent is insufficient, this problem can be solved by roughening at least a part of the surface of the image receiving sheet and/or the surface on the back side.

Particularly, when the substrate of the image-receiving sheet comprises a plastic sheet, a synthetic paper sheet or a laminate thereof with a cellulose fiber paper, and automatic sheet feeding is performed with the image-receiving sheets piled in a tray in the heat-sensitive printer, the image-receiving sheets tend to be delivered with two or more sheets in superposed state (so-called two-sheet feeding) to cause inconvenient sheet clogging even if an antistatic treatment has been applied on the surface of the sheets.

For solving this problem, it is desirable to roughen at least a part of both front and back surfaces of the image receiving sheet, for example, the non-image portion of the receiving surface or the back surface of the image-receiving sheet, by imparting fine unevenness thereto.

Label

The image-receiving sheet 31 of the present invention may be one having a laminated structure, as shown in Fig. 4, comprising a release treatment layer 33, a tacky layer 34, a substrate 35 and a receiving layer 36 successively laminated on a support 32. In this figure, reference numeral 37 designates cutting lines made by a half-cut process.

Also, the above image-receiving sheet 31 has a structure which is peelable between a support portion 38, comprising the above support 32 and the release treatment layer 33, and an image-receiving sheet portion 39, comprising the tacky layer 34, the substrate 35 and the receiving layer 36.

The above image-receiving portion 39 is the portion to be released from the support portion 38 and stuck onto various articles and comprises a structure in which the receiving layer 36 is provided on the substrate 35, and the tacky layer 34 which enables adhering onto the surface of a desired article is secured to the back surface of the substrate 35.

The image-receiving sheet 31 is subjected to a half-cut process for providing cutting lines 37 extending through all of the layers constituting said support portion 38 or sheet portion 39, at specific positions of the support portion 38 or the image-receiving sheet portion 39 of the layer constitution comprising the laminated structure as shown in Fig. 4. The half-cut process is generally applied after the lamination working of the image-receiving sheet prior to transfer image recording by the use of a commercially available punching device, etc. by controlling the depth of the progress, but the half-cut process may also be applied after transfer image recording, and the number of cutting lines, kinds of lines, shapes drawn by the lined, etc. are suitably set.

When the half-cut process is applied at the support portion 38, after transfer image recording, the peeling operation for peeling the support portion 38 from the image-receiving sheet portion 39 can be done easily and rapidly. Also, in the case of this example, in sticking a layer preferably with a thin thickness onto a card or the like, if the support portion is removed by peeling all at once, only the image-receiving sheet with a thin thickness remaining becomes inconvenient in handling, whereby adequate sticking will be difficult. In such a case, by applying the half-cut process so as to peel off only the support portion corresponding to the image forming portion to be stuck (e.g. image is formed at the central portion of the sheet) and permit the support portion which becomes the remaining peripheral portion to remain, peeling can

be done during sticking with only the support portion corresponding to said stuck portion, and the image-receiving portion can be supported by the remaining support portion to be handled very conveniently, whereby adequate sticking working can be done. In this case, after the image-receiving sheet portion has been stuck onto an article, the remaining support portion and the image-receiving sheet portion on said support portion are removed.

On the other hand, as shown in Fig. 5, when the image-receiving portion 39 is subjected to the half-cut process, the image-receiving sheet portion 39 can be sectionalized and, recording of desired transfer images carried out within the regions of the sections. Then the image-receiving sheet portion 39 within the section surrounded by the cutting line 37 can be released correctly and easily divided from the supporting portion 38.

In practically using the image-receiving sheet 31 constituted as described above, it is combined with the heat transfer sheet, and through migration of the dye in the colorant layer in the heat transfer sheet by heating by a thermal head, etc. to the receiving layer 36 of the image-receiving sheet, a transferred image is formed on the image-receveing sheet. Then the image-forming sheet portion 39 is peeled off from the support portion 38 along the cutting line 37 by the half-cut process, which step is followed by sticking of the image-receiving sheet portion having the transferred image 14 formed thereon onto an intended article 15, as shown in Fig. 6. The article 15 may be any article, provided that the transferred image can be plastered thereon.

The image-receiving sheet having the above composition is suitable for a use in which a large number of face pictures are formed, subjected to half-cut for respective sections of the respective face pictures, and peeled off to be stuck onto name cards or various ID cards.

Detection mark

For distinguishing whether the image-receiving sheet is the correct sheet to be used for the heat-sensitive transfer printer, and also, performing positional determination between the heat-transfer sheet and the image-receiving sheet, it is desirable to form a physically detectable detection mark on a part of the image-receiving sheet, ordinarily on the back surface of the sheet.

As a method for preparing the image-receiving sheet having the detection mark, each sheet obtained by cutting a sheet of the image-receiving sheet in a wound-up state is printed with a physically detectable mark at a position corresponding to a corner and/or a side, and then said sheet is cut to give an image-receiving sheet having a detection mark at the corner and/or the side.

Writing treatment layer

The image-receiving sheet of the present invention can have a writing treatment layer provided at a specific position on the receiving layer. The writing treatment layer refers to one on which writing with a pencil, a ball-point pen, a fountain pen, etc. or otherwise sealing, etc. can be done. By the provision of this layer, difficulty in writing, sealing, etc., because the receiving layer is generally constituted of a resin film surface, can be overcome, whereby comments, notes, etc. can be written freely on this layer. The writing treatment layer is formed by the use of a resin such as hydroxyethyl cellulose, polyvinyl acetate, or styrenemaleic acid copolymer which is mixed with calcium carbonate, silica, clay, etc.

Storability enhancing treatment of image

In the present invention, for storability enhancement of the transferred image, a protective layer can be formed on the surface of the receiving layer.

As the material for such protective layer, there are plastic films such as those of polyethyleneterephthalate, polypropylene, and rigid vinyl chloride, which are laminated on the receiving layer having an image formed thereon through a heat-meltable sheet or an adhesive.

Instead of providing a protective layer, it is also possible to wrap the sheet with a plastic film such as one of rigid vinyl chloride, polypropylene or polyethyleneterephthalate, or to store the sheet in a case made of those films.

Also, in the present invention, after formation of a dye image on the receiving layer of the image-receiving sheet, the dye forming the image can be amply color formed and dyed by heating with heating means such as a thermal head, heating rolls or a laminator, whereby an image having excellent image density, light resistance, stain resistance, etc. can be provided.

Further, in the present invention, after formation of a dye image on the receiving layer of the image-receiving sheet having a receiving layer comprising an uncured or semi-cured curable resin, the receiving layer can be cured by application of an energy such as heat or ionizable radiation to impart long term storability to the dye image.

Uses

The image-receiving sheet of the present invention is applicable for hard copy making of an image recorded on a

CRT picture face or an image recorded by a magnetic recording means, and may be used as it is after printing, or otherwise used after printing, with peel-off of the support. Alternatively, after printing, it can be caused to adhere with the printed surface pressed against an article on which it is to be transferred and then peeled off from the support before use.

Specific examples of uses are those as substitute products for printed matter, particularly printed matter for correction, and otherwise formation of face pictures of ID cards, formation of face pictures on name cards, picture attachments on telephone cards, premiums, postal cards, advertisements for windows, electric decorative signboards, various decorative articles, tags, labels for explanation of merchandise, labels for stationary articles, indices for audio cassettes or video cassettes, and other various uses.

Other considerations

Ordinarily, image-receiving sheets are stored and handled in a state in which a large number of sheets are stacked. In this case, it is preferable that the image-receiving sheets stacked in a large number be packaged and sealed with a cover comprising a soft packaging material and yet have a structure such that one end of said cover can be readily broken to be removed. By making such a structure, in using practically this stack, the user can break one end of said package and set the image-receiving sheets on a sheet-feeding cassette with the remainder of the cover still intact, that is without touching the image-receiving sheets internally of the cover by hand, whereby infiltration of dust or grime can be prevented so far as possible.

Also, in using the image-receiving sheet of the present invention, it is possible to use a sheet-feeding cassette provided with a cassette case with a sealed structure which is detachable relative to the printer and houses internally image-receiving sheets, the image-receiving sheet take-out outlet having been made openable.

The user, in using the paper-feeding cassette, merely opens the take-out outlet and can set the cassette case on the printer as it is without touching the image-receiving sheets therein by hand, whereby infiltration of dust or grime into the sheet-feeding cassette or leaving of fingerprints on the image-receiving sheets can be prevented.

Also, in using the image-receiving sheets of the present invention, it is preferable to provide a box-shaped case for housing a large number of stacked image-receiving sheets, which case is provided on one end with a take-out outlet for image-receiving sheets, a dust removing means provided at said take-out outlet, and a dust removing means for removing dust from the recording sheet during take-out of the image-receiving sheet, such as a dust removing brush or a dust removing tape.

Further, the heat-sensitive transfer printer may also be provided with a means for removing dust on the image-receiving sheet. As the means for removing dust, tacky rolls and/or deelectrification rolls can be used.

In formation of images by means of the sublimation transfer method, the image reproductivity varies according to the quality of a heat transfer sheet or an image receiving sheet and the fluctuation of a printer itself. Therefore, in using the present invention, it is preferable to prepare a reference color in advance in order to know the variation of the reproductivity of images.

Such a reference color may be prepared separately with the image receiving sheet, or the reference color may be formed on the part of the image receiving sheet, preferably on the edge of the surface where a receiving layer is formed. The reference color comprises a thin and long color scale consisting divided small parts of color, e.g., yellow, cyan, magenta and black. This color scale has preferably the range from shadow to highlight in each color. In printing, another color scale (reference color) may be formed together with images. In this case, the color scale formed with images is compared with the previously formed color scale thereby to inspect the reproductivity of images formed by sublimation printing. Thus, the quality of the image receiving sheet and the heat transfer sheet and the fluctuation of the operation conditions of a printer can be judged by users.

According to the result of the above determination, users can change the heat transfer sheet or the image receiving sheet, or adjust the operation conditions of the thermal printer, thereby to enhance the image reproductivity.

The present invention is described in more detail below by way of specific Examples, in which quantities expressed in parts and % are by weight unless otherwise specifically noted.

Example A-1

A porous polyethyleneterephthalate film having a density of about 73% relative to the density of the non-foamed polyethyleneterephthalate film (thickness 100 μ, density 1.04, produced by Diafoil K.K., commercially available as [foamed white polyester film]) was used as the substrate, and after an urethane type primer was applied and dried on one surface of this substrate, a composition for formation of a receiving layer of the following composition was applied by a Myer bar and dried (coating amount after drying 6 g/m^2) to form a receiving layer, thus obtaining an image-receiving sheet.

Composition for forming receiving layer

Polyester resin (Vylon 200, produced by Toyobo, Japan)	70 parts
Polyester resin (Vylon 290, produced by Toyobo, Japan)	30 parts
Amino-modified silicone (KF-393: produced by Shinetsu Kagaku Kogyo, Japan)	5 parts
Epoxy-modified silicone (X-22-343: produced by Shinetsu Kagaku Kogyo, Japan)	5 parts
Methyl ethyl ketone	350 parts
Toluene	350 parts

On the other hand, with the use of a polyester film with a thickness of 4.5 μ (Lumilar: produced by Toray, Japan) having a heat-resistant lubricating layer comprising a thermosetting acrylic resin provided on one surface as the substrate, the ink compositions for formation of heat transfer layer with the following compositions were applied on the substrate on the surface on the side where the heat-resistant lubricating layer was provided and the opposite side each to a coated amount after drying of 1 g/m^2 to obtain a heat transfer sheet.

Cyan ink composition for formation of heat transfer layer

Disperse dye (Kayaset Blue 714, produced by Nippon Kayaku, Japan)	5 parts
Polyvinyl butyral resin (Ethlec BX-1, produced by Sekisui Kagaku, Japan)	4 parts
Methyl ethyl ketone	46 parts
Toluene	45 parts

Magenta ink composition for formation of heat transfer layer

Disperse dye (MS Red G: produced by Mitsui Toatsu Kagaku, Japan) (Disperse Red 60)	2.6 parts
Disperse dye (Macrolex Violet R: produced by Bayer) (Disperse Violet 26)	1.4 parts
Polyvinyl butyral resin (Ethlec BX-1: produced by Sekisui Kagaku, Japan)	4.3 parts
Methyl ethyl ketone	45 parts
Toluene	45 parts

Yellow ink composition for formation of heat transfer layer

Disperse dye (Macrolex Yellow 6G: produced by Bayer) (Disperse Yellow 201)	5.5 parts
Polyvinyl butyral resin (Ethlec BX-1, produced by Sekisui Kagaku, Japan)	4.5 parts
Methyl ethyl ketone	45 parts
Toluene	45 parts

By the use of the heat transfer sheet together with the above image-receiving sheet, printing was peformed by means of a color video printer: VY-50 (produced by Hitachi Seisakusho) under the conditions shown below, and the reflective density of cyan was measured by a Macbeth color densitometer RD-918 to be 1.95. Also, the printing density was found to be uniform over the entire printed surface, and good transfer image could be obtained, without drop-out of dot being observed, with high printing densities for all of the three colors, without coarseness, color drift of the three colors or ground irregularity. Further, by controlling the electrical energy applied on the head by varying the pulse width, any desired printing density could be obtained with good reproducibility.

Printing conditions

Printing speed:	33.3 ms/line
Delivery pitch:	0.166 mm
Pulse width:	12.0 ms
Head application voltage:	11.0 V

Comparative Example A-1

When printing was performed on an image-receiving sheet obtained as in Example A-1 except for changing the substrate to a non-foamed white polyethyleneterephthalate film (thickness 100 μ, density 1.42, produced by Toray: E-20), the printing density was found to be lower as compared with Example A-1. There was coarseness in the half-tone image, and also color drift of the three colors was observed.

Example A-2

A porous polyethyleneterephthalate film having a density of about 80% relative to the density of the non-foamed film (thickness 75 μ, density 1.16, produced by Teijin K.K., commercially available as [porous PET]) was used as the substrate, and a composition for formation of an intermediate layer shown below was applied and dried on one surface of this substrate (coating amount after drying 5 g/m^2).

Composition for formation of intermediate layer

Polyester resin (Vylon 200, produced by Toyobo)	60 parts
Polyester resin (Vylon 600, produced by Toyobo)	40 parts
Solvent (methyl ethyl ketone/toluene = 1/1)	650 parts

Subsequently, on the intermediate layer formed as described above, a composition for formation of a receiving layer with the following composition was applied by a Myer bar and dried (coating amount after drying 5 g/m^2) to form a receiving layer.

Composition for forming receiving layer

Polyester resin (Vylon 200, produced by Toyobo)	70 parts
Vinyl chloride-vinyl acetate compolymer (Vinylite VYHH, produced by Union Carbide)	30 parts
Amino-modified silicone (KF-393: produced by Shinetsu Kagaku Kogyo, Japan)	7 parts
Epoxy-modified silicone (X-22-343: produced by Shinetsu Kagaku Kogyo, Japan)	7 parts
Solvent (methyl ethyl ketone/toluene) = 1/1)	700 parts

Further, on the surface on which a receiving layer was not formed of the substrate having a receiving layer formed thereon, a tackifier (Finetack SPS-1001, produced by Dainippon Ink Kogyo K.K.) was applied and dried (coating amount after drying about 20 g/m^2) and caused to adhere onto the release treated surface of a commercially available releasable paper to provide an image-receiving sheet.

As the result of the same printing operation as in Example A-1 on the image-receiving sheet, the image density was high without color drift of the three colors. This sheet was suitable as a decorative label when the releasable paper was peeled off.

Comparative Example A-2

An image-receiving sheet was obtained as in Example A-2 except for changing the substrate to a non-foamed white polyethyleneterephthalate film (thickness 75 μ, density 1.42, produced by Toray: E-20). When printing was performed on the sheet in the same manner as in Example A-1, the image density was found to be lower as compared with that in Example A-1. There was coarseness in the half-tone image, and also color drift of the three colors was detected.

Example A-3

A foamed polypropylene film having a density of about 69% relative to the density of non-foamed film (thickness 60 μ, density 0.62, produced by Toray: Torefan BOYP) was used as the substrate, and, after an urethane type primer was applied and dried thereon, a receiving layer was further provided in the same manner as in Example A-1 (coated amount after drying 5 g/m^2) to provide an image-receiving sheet. When printing was performed on the image-receiving sheet in the same manner as in Example A-1, the printing density was high, and also no drop-out of dots was observable. Furthermore, a good image could be obtained without color drift of the three colors.

Example A-4

Image-receiving sheets were obtained as in Example A-1 except for the use of the following composition (A) and a composition to which an anatase type titanium oxide (produced by Titanium Kogyo; KA-10), a benzooxazole type fluorescent brightener (produced by CIBAGEIGY Co.; Uvitex OB), a colorant dye (produced by Nippon Kayaku; Kayaset Blue-N), a red dye (produced by Bayer Co.; Macrolex Red Viotet R) had been added in amounts shown in Table 1.

Compostion (A) for forming receiving layer

Polyester resin (Vylon 600, produced by Toyobo, Japan)	6.6 parts
Polyvinyl chloride acetate (produced by Denki Kagaku: #1000A)	9.0 parts
Amino-modified silicone oil (produced by Shinetsu kagaku, Japan; X-22-350C)	0.3 part
Epoxy-modified silicone oil (produced by Shinetsu Kagaku, Japan; X-22-3000E)	0.3 part
Toluene	42.2 parts
Methyl ethyl ketone	42.2 parts

L, a and b values of the image-receiving sheets obtained as described above were measured by SM color computer (SM-4CH Model) produced by Suga Testing Machine. The measured values are shown in the following Table 1.

Table 1

No.	White pigment (wt. parts)	Blue dye (wt. parts)	Red dye (wt. parts)	L	a	b	Visual judgement
1	0	0	0	94.38	-0.95	2.02	tinted in yellow
2	0	0.003	0.003	90.51	-0.29	-3.89	good white
3	0.75	0.003	0.003	92.50	0.12	-3.52	good white

Example A-5

Two kinds of image-receiving sheets were obtained as in Example A-1 except for the use of the following composition (B) and the following composition (C) as the composition for formation of receiving layer, respectively. Also, for comparison, an image-receiving sheet was prepared by the use of the following composition (D).

Composition (B) for forming receiving layer

Vinyl chloride/2-hydroxyethyl acrylate = 80/20 (each mole) copolymer resin	2 parts
Amino-modified silicone (KF-393: produced by Shinetsu Silicone, Japan)	0.125 part
Epoxy-modified silicone (X-22-343: produced by Shinetsu Silicone, Japan)	0.125 part
Toluene	10 parts
Methyl ethyl ketone	10 parts

Composition (C) for forming receiving layer

Vinyl chloride/2-hydroxyethyl acrylate maleic acid = 83.6/16/0.4 (each mole) Copolymer resin (Ethlec E-C110, produced by Sekisui Kagaku Kogyo, K.K., Japan)	2 parts
Amino-modified silicone (KF-393: produced by Shinetsu Silicone, Japan)	0.125 part
Epoxy-modified silicone (X-22-343: produced by Shinetsu Silicone, Japan)	0.125 part
Toluene	10 parts
Methyl ethyl ketone	10 parts

Composition (D) for forming receiving layer

Polyester resin (Vylon 200, produced by Toyobo, Japan)	2 parts
Elvaroy 741 (EVA type polymeric plasticizer, produced by Mitsui Polychemical, Japan)	2 parts
Amino-modified silicone (KF-393: produced by Shinetsu Silicone, Japan)	0.125 part
Epoxy-modified silicone (X-22-343: produced by Shinetsu Silicone, Japan)	0.125 part
Toluene	10 parts
Methyl ethyl ketone	10 parts

After printing was performed on each image-receiving sheet obtained according to the same method as in Example A-1, weathering resistance test was conducted to obtain the results as shown below in Table 2.

Weathering resistance test

Weathering resistance was measured according to JIS L0842, and those with the initial fastness in the second exposure method of JIS L0841 exceeding class 3 were rated as ◎, and those not satisfying class 3 as x.

Table 2

	Weathering resistance test results
B	◎
C	◎
D	X

Example A-6

As the composition for forming a receiving layer, the following composition (E) was used, and further the composition (F) for comparative purpose, to obtain 3 kinds of image-receiving sheets.

Composition (E) for forming receiving layer

Polyamide resin (produced by Henkel Hakusuisha: Versamide 744)	10 parts
Amino-modified silicone oil (produced by Shinetsu Kagaku Kogyo: KF-396)	1 part
Epoxy-modified silicone oil (produced by Shinetsu Kagaku Kogyo: X-22-343)	1 part
Toluene	20 parts
Isopropyl alcohol	20 parts

After printing was performed on the image-receiving sheet obtained in the same manner as in Example A-1, the relative density was measured by a densitometer RD-918 produced by Macbeth Co., USA. As the result, it was found to be 1.5 for one using the composition (E) and 1.0 for one using the composition (F).

Claims

1. An image-receiving sheet for use in heat transfer recording, comprising a base sheet and a receiving layer provided on one surface of said base sheet for receiving a dye or a pigment migrating from a heat transfer sheet during said heat transfer recording,
said receiving layer comprising a resin which is capable of receiving the thus migrated dye or pigment from the heat transfer sheet,
said base sheet comprising a laminate of (i) a first layer having a porous structure or foamed structure and (ii) a second layer comprising a non-foamed structure, said first layer being disposed between said second layer and said receiving layer, said second layer being provided on said first layer in a freely peelable off state.

2. An image-receiving sheet according to claim 1, wherein a third layer comprising a porous structure or foamed structure is formed on the outer surface of the second layer.

3. An image-receiving sheet for use in heat transfer recording, comprising a base sheet and a receiving layer provided on one surface of said base sheet for receiving a dye or a pigment migrating from a heat transfer sheet during said heat transfer recording,
said receiving layer comprising a resin which is capable of receiving the thus migrated dye or pigment from the heat transfer sheet,
said base sheet comprising a porous structure or foamed structure and having no non-porous or non-foamed layer.

4. An image-receiving sheet according to claim 1, wherein the first layer has a density of 90% or less of the density of the non-foamed product of the same material as said first layer.

5. An image-receiving sheet according to claim 1, wherein the second layer and the receiving layer comprise transparent materials.

6. An image-receiving sheet according to claim 1, wherein a tackifier layer is formed between the first and second layers.

7. An image-receiving sheet according to claim 1, wherein a releasing treatment is applied on the second layer.

8. An image-receiving sheet according to claim 1, wherein a half-cut treatment is applied at a specific portion thereof.

9. An image-receiving sheet according to claim 1, wherein an intermediate layer is formed between the base sheet and the receiving layer.

10. An image-receiving sheet according to claim 1, wherein the receiving layer has dyeability and comprises a sythetic resin having weathering resistance.

11. An image-receiving sheet according to claim 10, wherein the receiving layer comprises a copolymer of vinyl chloride and an acrylic acid type monomer.

12. An image-receiving sheet according to claim 11, wherein said acrylic acid type monomer has a polar group.

13. An image-receiving sheet according to claim 10, wherein said receiving layer comprises a resinous composition composed mainly of a polyvinyl chloride.

14. An image-receiving sheet according to claim 13, wherein the receiving layer comprises a fabricated film formed by film formation.

15. An image-receiving sheet according to claim 13, wherein a plasticiser or a thermoplasticity imparting agent is further added to the resinous composition constituting the receiving layer.

16. An image-receiving sheet according to claim 1, wherein the receiving layer comprises a resin having an amide bond or a modified resin thereof.

17. An image-receiving sheet according to claim 16, wherein said resin having an amide bond is a resin obtained by condensation between one or two or more kinds of dicarboxylic acids having aliphatic hydrocarbon chains with 6 or more carbon atoms or derivatives thereof and one or two or more kinds of diamine compounds.

18. An image-receiving sheet according to claim 1, wherein the second layer comprises a cellulose fiber paper, and the first layer comprises a plastic sheet.

19. An image-receiving sheet according to claim 1, wherein at least one part of at least one of the two surfaces of the image-receiving sheet is roughened.

20. An image-receiving sheet according to claim 1, wherein the surface reflective characteristics of the surface on which the receiving layer is provided as a coating in terms of the respective values L, a and b as measured by the method defined according to the Japanese Industrial Standards designation JIS-z8722 and represented by the method defined according to designation JIS-z8730 are within the ranges of L=90 or more, a=-1.0 to +2.0 and b=-2.0 to -5.0.

21. An image-receiving sheet according to claim 6, wherein the tackifier layer comprises a strong tackifier layer.

22. An image-receiving sheet according to claim 6, wherein the tackifier layer comprises a weak tackifier layer.

23. An image-receiving sheet according to claim 1, wherein the outer surface of the receiving layer is readily releasable from a heat transfer sheet.

24. An image-receiving sheet according to claim 1, wherein the weight of residual solvent in the receiving layer is 1% or less of the weight of the solvent soluble components in the receiving layer.

25. An image-receiving sheet according to claim 1, wherein the resin constituting the receiving layer has a glass transition point of 40°C or higher.

26. An image-receiving sheet according to claim 1, having releasability imparted by the application thereon of a release agent comprising a polymer having the releasable moiety in the main chain or the side chain.

27. An image-receiving sheet according to claim 26, wherein the releasable moiety of the polymer is a polysiloxane or a long chain alkyl group.

28. An image-receiving sheet according to claim 1, having a detection mark on a part of either surface thereof.

29. An image-receiving sheet according to claim 6 or 7, wherein either the portion inclusive of the tackifier layer or supper part thereof (the receiving layer side) or the portion containing no tackifier layer therebelow (the support side) is cut into a predetermed shape.

30. A tacky label comprising an image-receiving sheet of claim 6 having a dye image receiving layer.

Patentansprüche

1. Bildempfangsblatt zur Verwendung bei der Thermotransfer-Aufzeichnung, umfassend ein Grundblatt und eine Empfangsschicht, die auf einer Oberfläche des Grundblatts angeordnet ist, um einen Farbstoff oder ein Pigment, welcher bzw. welches während der Thermotransfer-Aufzeichnung von einem Thermotransferblatt migriert, aufzunehmen,
wobei die Empfangsschicht ein Harz umfaßt, welches in der Lage ist, den bzw. das dergestalt migrierte(n) Farbstoff bzw. Pigment von dem Thermotransferblatt aufzunehmen,
und wobei das Grundblatt ein Laminat von (i) einer ersten Schicht mit einer porösen Struktur oder geschäumten Struktur und (ii) einer zweiten Schicht, umfassend eine nicht-geschäumte Struktur, umfaßt, wobei die erste Schicht zwischen der zweiten Schicht und der Empfangsschicht angeordnet ist und die zweite Schicht auf der ersten Schicht in einem frei ablösbaren Zustand vorgesehen ist.

2. Bildempfangsblatt nach Anspruch 1, wobei eine dritte Schicht, umfassend eine poröse Struktur oder geschäumte Struktur, auf der äußeren Oberfläche der zweiten Schicht gebildet ist.

3. Bildempfangsblatt zur Verwendung bei der Thermotransfer-Aufzeichnung, umfassend ein Grundblatt und eine Empfangsschicht, welche auf einer Oberfläche des Grundblatts angeordnet ist, um einen Farbstoff oder ein Pigment, welcher bzw. welches während der Thermotransfer-Aufzeichnung von einem Thermotransferblatt migriert, aufzunehmen,
wobei die Empfangsschicht ein Harz umfaßt, welches in der Lage ist, den bzw. das dergestalt migrierte(n) Farbstoff bzw. Pigment von dem Thermotransferblatt aufzunehmen,
und wobei das Grundblatt eine poröse Struktur oder geschäumte Struktur umfaßt und keine nicht-poröse oder nichtgeschäumte Schicht aufweist.

4. Bildempfangsblatt nach Anspruch 1, wobei die erste Schicht eine Dichte von 90 % oder weniger der Dichte des nicht-geschäumten Produkts aus demselben Material wie der ersten Schicht aufweist.

5. Bildempfangsblatt nach Anspruch 1, wobei die zweite Schicht und die Empfangsschicht transparente Materialien umfassen.

6. Bildempfangsblatt nach Anspruch 1, wobei eine klebrig machende Schicht zwischen der ersten und der zweiten Schicht gebildet ist.

7. Bildempfangsblatt nach Anspruch 1, wobei eine Trennbehandlung auf der zweiten Schicht angewendet wurde.

8. Bildempfangsblatt nach Anspruch 1, wobei eine Habschnitt-Behandlung bei einem bestimmten Teil davon angewendet wurde.

9. Bildempfangsblatt nach Anspruch 1, wobei eine Zwischenschicht zwischen dem Grundblatt und der Empfangsschicht gebildet ist.

10. Bildempfangsblatt nach Anspruch 1, wobei die Empfangsschicht eine Färbbarkeit aufweist und ein synthetisches Harz mit einer Witterungsbeständigkeit umfaßt.

11. Bildempfangsblatt nach Anspruch 10, wobei die Empfangsschicht ein Copolymer von Vinylchlorid und einem Monomer vom Acrylsäuretyp umfaßt.

12. Bildempfangsblatt nach Anspruch 11, wobei das Monomer vom Acrylsäuretyp eine polare Gruppe aufweist.

13. Bildempfangsblatt nach Anspruch 10, wobei die Empfangsschicht eine harzartige Zusammensetzung umfaßt, welche hauptsächlich aus einem Polyvinylchlorid gebildet ist.

14. Bildempfangsblatt nach Anspruch 13, wobei die Empfangsschicht einen angefertigten Film umfaßt, welcher durch Filmbildung hergestellt wurde.

15. Bildempfangsblatt nach Anspruch 13, wobei ein Weichmacher oder ein Thermoplastizität verleihendes Mittel der harzartigen Zusammensetzung, welche die Empfangsschicht bildet, zusätzlich zugegeben wird.

16. Bildempfangsblatt nach Anspruch 1, wobei die Empfangsschicht ein Harz umfaßt, welches eine Amidbindung oder ein modifiziertes Harz davon umfaßt.

17. Bildempfangsblatt nach Anspruch 16, wobei das Harz, welches eine Amidbindung aufweist, ein Harz ist, welches durch Kondensation zwischen einem oder zwei oder mehreren Arten von Dicarbonsäuren mit aliphatischen Kohlenwasserstoffketten mit 6 oder mehr Kohlenstoffatomen oder Derivaten davon und einem oder zwei oder mehreren Arten von Diaminverbindungen erhalten wurde.

18. Bildempfangsblatt nach Anspruch 1, wobei die zweite Schicht ein Cellulosefaserpapier umfaßt, und die erste Schicht ein Kunststoffblatt umfaßt.

19. Bildempfangsblatt nach Anspruch 1, wobei mindestens ein Teil von mindestens einer der zwei Oberflächen des Bildempfangsblatts aufgerauht ist.

20. Bildempfangsblatt nach Anspruch 1, wobei die Oberflächenreflexionscharakteristika der Oberfläche, auf welcher die Empfangsschicht als Überzug angeordnet ist, ausgedrückt durch die jeweiligen Werte L, a und b, welche durch das gemäß der Japanese Industrial Standards-Norm JIS-z8722 definierte Verfahren gemessen und durch das gemäß der Norm JIS-z8730 definierte Verfahren dargestellt werden, in den Bereichen von L=90 oder mehr, a=-1,0 bis +2,0 und b=-2,0 bis - 5,0 liegen.

21. Bildempfangsblatt nach Anspruch 6, wobei die klebrig machende Schicht eine starke klebrig machende Schicht umfaßt.

22. Bildempfangsblatt nach Anspruch 6, wobei die klebrig machende Schicht eine schwache klebrig machende Schicht umfaßt.

23. Bildempfangsblatt nach Anspruch 1, wobei die äußere Oberfläche der Empfangsschicht leicht von einem Wärmeübertragungsblatt ablösbar ist.

24. Bildempfangsblatt nach Anspruch 1, wobei das Gewicht des restlichen Lösungsmittels in der Empfangsschicht 1 % oder weniger des Gewichts der Lösungsmittel-löslichen Komponenten in der Empfangsschicht beträgt.

25. Bildempfangsblatt nach Anspruch 1, wobei das Harz, welches die Empfangsschicht bildet, einen Glasübergangspunkt von 40°C oder höher aufweist.

26. Bildempfangsblatt nach Anspruch 1, welches eine Ablösbarkeit aufweist, welche durch die Anwendung eines Trennmittels darauf verliehen wurde, wobei das Trennmittel ein Polymer umfaßt, welches den ablösbaren Teil in der Hauptkette oder der Seitenkette aufweist.

27. Bildempfangsblatt nach Anspruch 26, wobei der ablösbare Teil des Polymers ein Polysiloxan oder eine Langketten-Alkylgruppe ist.

28. Bildempfangsblatt nach Anspruch 1, welches eine Nachweismarkierung auf einem Teil von einer seiner Oberflächen aufweist.

29. Bildempfangsblatt nach Anspruch 6 oder 7, wobei entweder der Teil einschließlich der klebrig machenden Schicht oder der obere Teil davon (die Empfangsschichtseite) oder der Teil, welcher keine klebrig machende Schicht darunter enthält (die Trägerseite) in eine vorbestimmte Form geschnitten ist.

30. Klebriges Etikett, umfassend ein Bildempfangsblatt gemäß Anspruch 6, welches eine Farbbildempfangsschicht aufweist.

Revendications

1. Feuille réceptrice d'image destinée à être utilisée dans l'enregistrement par transfert par la chaleur, comprenant une feuille de base et une couche réceptrice disposée sur une surface de ladite feuille de base pour recevoir un colorant ou un pigment migrant depuis une feuille de transfert par la chaleur pendant ledit enregistrement par transfert par la chaleur,
ladite couche réceptrice comprenant une résine qui est capable de recevoir le colorant ou pigment qui a ainsi migré

depuis la feuille de transfert par la chaleur,
ladite feuille de base comprenant un stratifié de (i) une première couche ayant une structure poreuse ou une structure expansée et de (ii) une seconde couche comprenant une structure non expansée, ladite première couche étant disposée entre ladite seconde couche et ladite couche réceptrice, ladite seconde couche étant disposée sur ladite première couche à l'état librement détachable.

2. Feuille réceptrice d'image selon la revendication 1, dans laquelle une troisième couche comprenant une structure poreuse ou une structure expansée est formée sur la surface extérieure de la seconde couche.

3. Feuille réceptrice d'image destinée à être utilisée dans l'enregistrement par transfert par la chaleur, comprenant une feuille de base et une couche réceptrice disposée sur une surface de ladite feuille de base pour recevoir un colorant ou un pigment migrant depuis une feuille de transfert par la chaleur pendant ledit enregistrement par transfert par la chaleur,
ladite couche réceptrice comprenant une résine qui est capable de recevoir le colorant ou pigment qui a ainsi migré depuis la feuille de transfert par la chaleur,
ladite feuille de base comprenant une structure poreuse ou une structure expansée et n'ayant aucune couche non poreuse ou non expansée.

4. Feuille réceptrice d'image selon la revendication 1, dans laquelle la première couche a une densité de 90 % ou moins de la densité du produit non expansé de la même matière que ladite première couche.

5. Feuille réceptrice d'image selon la revendication 1, dans laquelle la seconde couche et la couche réceptrice comprennent des matières transparentes.

6. Feuille réceptrice d'image selon la revendication 1, dans laquelle une couche d'agent adhésif est formée entre les première et seconde couches.

7. Feuille réceptrice d'image selon la revendication 1, dans laquelle un traitement de séparation est appliqué à la seconde couche.

8. Feuille réceptrice d'image selon la revendication 1, dans laquelle un traitement de demi-coupe est appliqué sur une portion spécifique de celle-ci.

9. Feuille réceptrice d'image selon la revendication 1, dans laquelle une couche intermédiaire est formée entre la couche de base et la couche réceptrice.

10. Feuille réceptrice d'image selon la revendication 1, dans laquelle la couche réceptrice est facile à teindre et comprend une résine synthétique résistant aux intempéries.

11. Feuille réceptrice d'image selon la revendication 8, dans laquelle la couche réceptrice comprend un copolymère de chlorure de vinyle et d'un monomère du type acide acrylique.

12. Feuille réceptrice d'image selon la revendication 11, dans laquelle ledit monomère du type acide acrylique a un groupe polaire.

13. Feuille réceptrice d'image selon la revendication 10, dans laquelle ladite couche réceptrice comprend une composition résineuse composée principalement d'un chlorure de polyvinyle.

14. Feuille réceptrice d'image selon la revendication 13, dans laquelle la couche réceptrice comprend un film préfabriqué formé par formation d'un film.

15. Feuille réceptrice d'image selon la revendication 13, dans laquelle un plastifiant ou un agent conférant la thermoplasticité est encore ajouté à la composition résineuse constituant la couche réceptrice.

16. Feuille réceptrice d'image selon la revendication 1, dans laquelle la couche réceptrice comprend une résine à liaisons amide ou une résine à liaisons amide modifiée.

17. Feuille réceptrice d'image selon la revendication 16, dans laquelle ladite résine à liaisons amide est une résine obtenue par condensation entre un ou deux types ou plus d'acides dicarboxyliques ayant des chaînes hydrocarbo-

nées aliphatiques en C_6 ou plus ou leurs dérivés et un ou deux types de composés diamines ou plus.

18. Feuille réceptrice d'image selon la revendication 1, dans laquelle la seconde couche comprend un papier de fibres de cellulose et la première couche comprend une feuille plastique.

19. Feuille réceptrice d'image selon la revendication 1, dans laquelle une partie au moins d'au moins une des deux surfaces de la couche réceptrice d'image est rendue rugueuse.

20. Feuille réceptrice d'image selon la revendication 1, dans laquelle les caractéristiques réfléchissantes de surface de la surface revêtue par la couche réceptrice, exprimées par les valeurs L, a et b respectivement, mesurées par la méthode définie selon la norme japonaise JIS-Z8722 et représentées par la méthode définie selon la norme JIS-Z8730 sont dans les gammes suivantes : L = 90 ou plus, a = -1,0 à +2,0 et b = -2,0 à -5,0.

21. Feuille réceptrice d'image selon la revendication 6, dans laquelle la couche d'agent adhésif comprend une couche d'agent adhésif puissant.

22. Feuille réceptrice d'image selon la revendication 6, dans laquelle la couche d'agent adhésif comprend une couche d'agent adhésif faible.

23. Feuille réceptrice d'image selon la revendication 1, dans laquelle la surface extérieure de la couche réceptrice est facilement détachable d'une feuille de transfert par la chaleur.

24. Feuille réceptrice d'image selon la revendication 1, dans laquelle le poids de solvant résiduel dans la couche réceptrice est de 1 % ou moins du poids des constituants solubles du solvant dans la couche réceptrice.

25. Feuille réceptrice d'image selon la revendication 1, dans laquelle la résine constituant la couche réceptrice a un point de transition vitreuse de 40°C ou plus.

26. Feuille réceptrice d'image selon la revendication 1, qui est rendue détachable par l'application sur celle-ci d'un agent de séparation comprenant un polymère ayant la portion séparable dans la chaîne principale ou les chaînes latérales.

27. Feuille réceptrice d'image selon la revendication 26, dans laquelle la portion séparable du polymère est un groupe polysiloxane ou un groupe alkyle à longue chaîne.

28. Feuille réceptrice d'image selon la revendication 1, ayant une marque de repérage sur une partie de l'une ou l'autre de ses surfaces.

29. Feuille réceptrice d'image selon la revendication 6 ou 7, dans laquelle soit la portion contenant la couche d'agent adhésif ou sa partie supérieure (le côté de la couche réceptrice) soit la portion ne contenant pas la couche d'agent adhésif au-dessous de celle-ci (le côté du support) est découpée dans une forme prédéterminée.

30. Etiquette collante comprenant une feuille réceptrice d'image selon la revendication 6 ayant une couche réceptrice d'image de colorant.

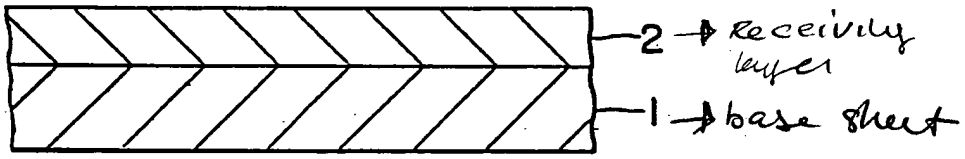

FIG. 1

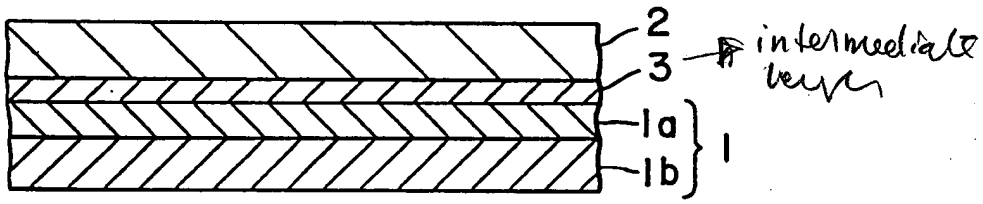

FIG. 2

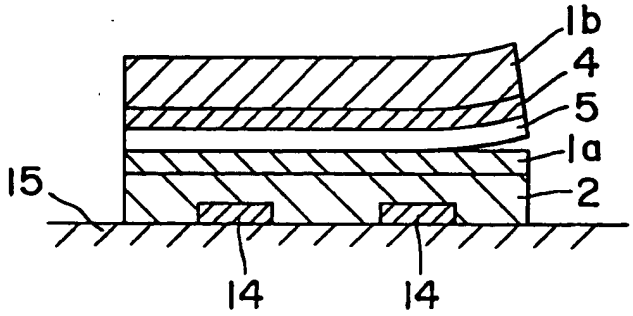

FIG. 3

image

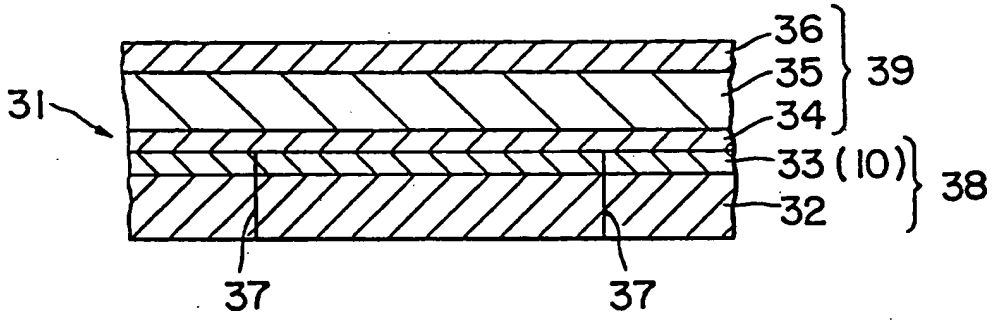

FIG. 4

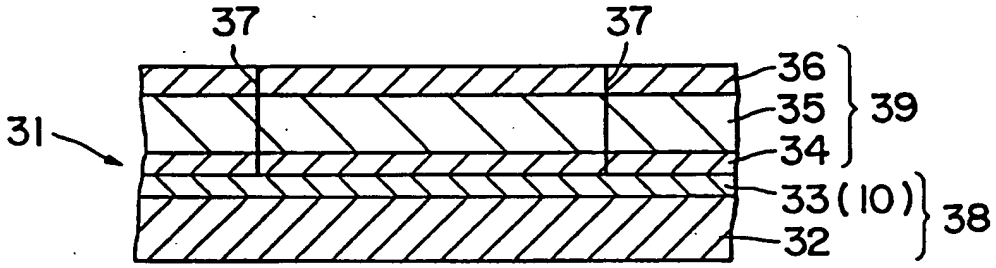

FIG. 5

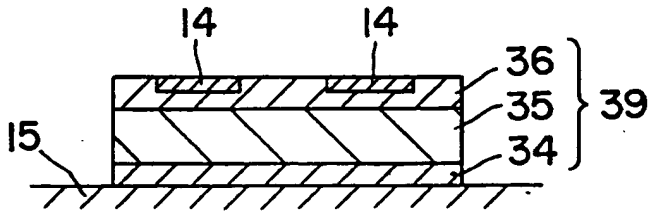

FIG. 6